

# Tiphiidae wasps of Madagascar (Hymenoptera, Tiphiidae)

Lynn S. Kimsey

*Bohart Museum of Entomology, Department of Entomology, One Shields Ave., University of California, Davis 95616, USA*

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Corresponding author: Lynn S. Kimsey ([lskimsey@ucdavis.edu](mailto:lskimsey@ucdavis.edu))

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## Abstract

The tiphiid wasp fauna of Madagascar consists of 28 endemic species, including 12 species of *Anthobosca* (Anthoboscinae), nine species of *Methocha* (Methochinae), two species of *Tiphia* (Tiphinae) and in the Myzininae three species of *Meria*, eight species of *Mesa* and two species of *Myzinella*. Seven species of *Methocha*, *arcuata*, *depressa*, *flavipalpus*, *impunctata*, *nasiformis*, *robusta* and *strigosa*, and one species of *Myzinella*, *minima*, are described as new. All of the genera are shared with mainland Africa.

## Keywords

Tiphiidae, *Anthobosca*, *Meria*, *Mesa*, *Methocha*, *Myzinella*, *Tiphia*

## Introduction

Madagascar has a relatively diverse, though seemingly recent tiphiid fauna. The least derived tiphiid subfamily Anthoboscinae is particularly species-rich on Madagascar, with nearly as many species as are found on continental Africa (Kimsey 2009). Three other tiphiid subfamilies, Methochinae, Myzininae and Tiphinae, are present as well, although they are less diverse relative to the mainland fauna than are the anthobos-



cines. None of the Malagasy tephid genera are endemic to the island, but all of the tephid species in Madagascar are endemic. There are seven myzinine genera in the Afrotropical Region including *Braunsomeria* Turner, *Meria* Illiger, *Mesa* Saussure, *Myzinella* Guiglia, *Parameria* Guérin de Meneville, *Poecilotiphia* Cameron and *Pseudomeria* Saunders. Only *Meria*, *Mesa* and *Myzinella* are recorded from Madagascar. The subfamilies Methochinae and Tephinae are represented by species in the genera *Methocha* and *Tiphia* respectively.

The modern Malagasy tephid fauna clearly derives from mainland Africa. These wasps are strong fliers but many species have wingless or brachypterous females. Tephid wasps are, where known, parasites of beetle larvae, particularly in the Scarabaeidae and Cicindellidae. Their host larvae are largely found in the soil and the tephid females spend considerable time on the ground, which makes rafting on plant debris unlikely but not impossible. Thus, dispersal of tephid wasps across the oceanic channel to Madagascar from mainland Africa seems unlikely. However, over a period of tens of millions of years even a small number of successful dispersals might be sufficient to establish populations on the island (Tattersall 2008). Studies of other animals with relatively poor dispersal capabilities, such as non-flying vertebrates (Vences 2004) and ants (Fisher 1996) show a similar pattern of origin from Africa.

The California Academy of Sciences' Arthropods of Madagascar Project funded by the U.S. National Science Foundation revealed a more diverse tephid fauna than previously recorded, including seven new species of *Methocha* and one species of *Myzinella* that are described below.

## Materials and methods

Specimens in this study were obtained from the California Academy of Sciences Arthropods of Madagascar Project and the Bohart Museum of Entomology. Holotypes and paratypes are deposited in the California Academy of Sciences, San Francisco (SAN FRANCISCO) and the Bohart Museum of Entomology, University of California, Davis (DAVIS). Other type repositories are indicated by the city names in parentheses in the species lists: BERLIN = Museum für Naturkunde, Berlin, Germany; BOLOGNA = Bologna Zoological Museum, Bologna, Italy; GENEVA = Museum of Natural History, Geneva, Switzerland; ITHACA = Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands; LONDON = Department of Entomology, the Natural History Museum, London; PARIS = Muséum National d'Histoire Naturelle, Laboratoire d'Entomologie, Paris, France; VIENNA = Naturhistorisches Museum, Vienna, Austria, and WASHINGTON = U.S. National Museum, Washington, D. C., USA.

The systematics of members of the family Tephidae is largely based on males. Females are less commonly collected and association of the sexes is problematic at best. This situation is also true in Madagascar, as a result the species level keys below are only to males where indicated as most of the females are unknown or unassociated.



## Key to the Tiphid Genera of Madagascar

- 1 Wingless, slender, ant-like; hindtibia with one apical spur; Subfamily Methochinae (females)..... ***Methocha* Latreille**
- Winged, heavy-bodied or elongate and slender, not ant-like; hindtibia with two apical spurs (males and females) ..... **2**
- 2 Frons flattened medially, without frontal lobes, antenna inserted vertically...**3**
- Frons strongly produced medially into lobes or platform above antennae, antenna inserted obliquely beneath.....**4**
- 3 Male apical metasomal sternum modified into curved, spine-like uncus (Fig. 3); marginal cell incomplete apically; Subfamily Tiphinae.... ***Tiphia* Fabricius**
- Male apical metasomal sternum unmodified (Fig. 2); forewing marginal cell complete (Fig. 2); Subfamily Anthoboscinae ***Anthobosca* Guérin de Méneville**
- 4 Mesopleural lamella small, digitate; parameres always exerted well beyond apex of apical tergum (Fig. 1); antennal lobes tooth-like or simple; Subfamily Methochinae.....***Methocha* Latreille**
- Mesopleural lamella large, broad, flattened; parameres generally not visible externally (Figs 4–6); antennal lobes rounded, often forming platform above antennal sockets; Subfamily Myzininae ..... **5**
- 5 Metasomal segment I broadly sessile, broader than long, not nodose (Fig. 5)....  
..... ***Meria* Illiger**
- Metasomal segment I with narrow elongate petiole, twice as long as or longer than broad, posteriorly nodose (Figs 4, 6) ..... **6**
- 6 Metasomal segment I more than 3× as long as broad, terga without transverse subbasal carina (Fig. 4) ..... ***Mesa* Saussure**
- Metasomal segment I less than twice as long as broad, terga with transverse subbasal carina (Fig. 6) ..... ***Myzinella* Guiglia**

## Systematics

### Subfamily Anthoboscinae

#### Genus *Anthobosca* Guérin de Méneville

<http://species-id.net/wiki/Anthobosca>

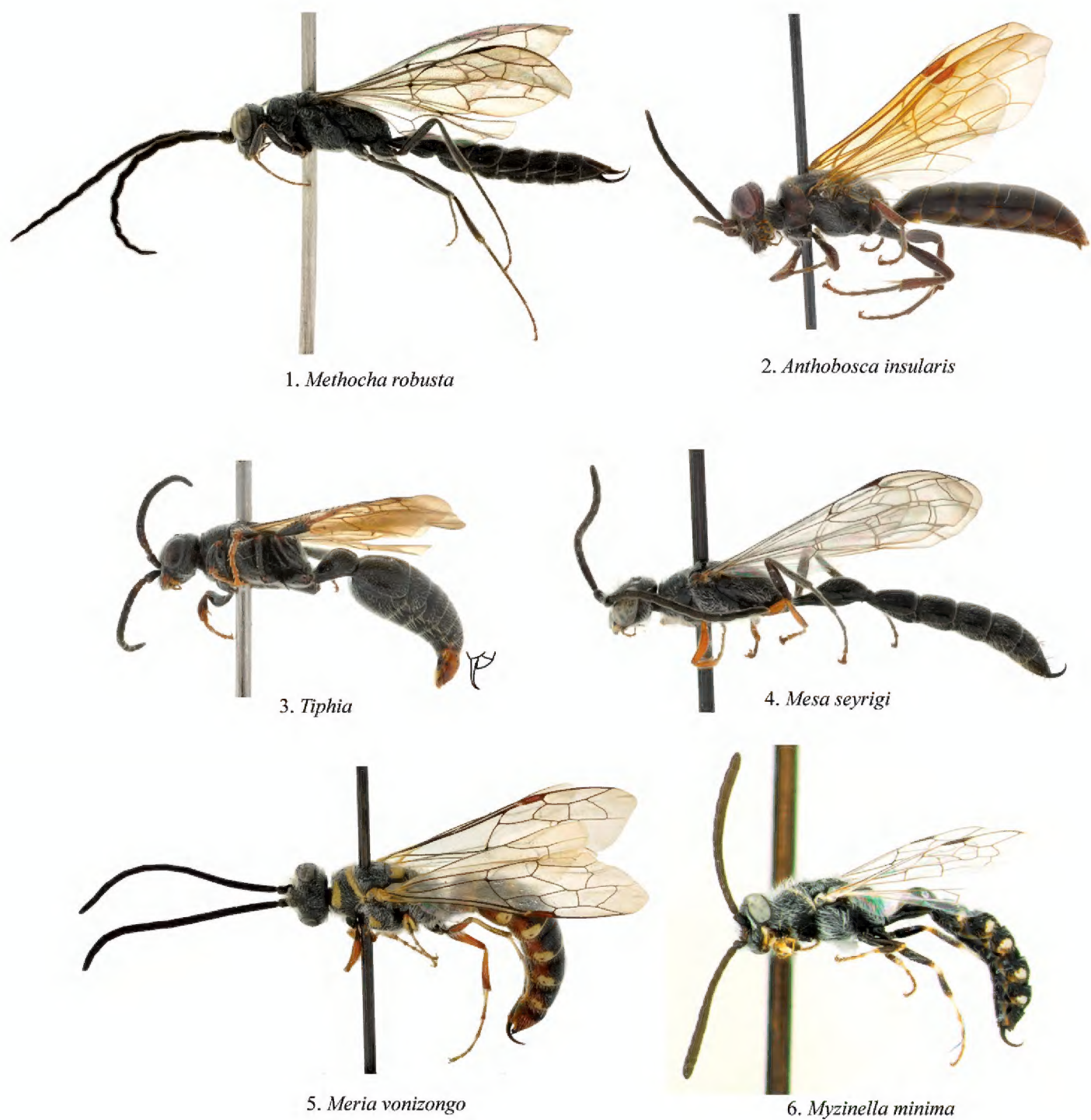
Fig. 2

*Anthobosca* Guérin de Méneville 1838:237.

**Type species:** *Anthobosca australasiae* Guérin de Méneville 1838:237.

**Discussion.** This is the least derived genus in the family Tiphidae (Kimsey 1991). Both sexes are fully winged, with complete venation. Males are slenderer than females, with linear, cylindrical antennae. Females are less commonly collected than males, and are heavy-bodied with coiled antennae. The face is flat, without supraantennal lobes,





**Figures 1–6.** Lateral view of males. **1** *Methocha* **2** *Anthobosca* **3** *Tiphia* (uncus obscured by genital capsule shown in inset) **4** *Mesa* **5** *Meria* **6** *Myzinella*.

similar to the face in Tiphinae. There are fourteen *Anthobosca* species described from mainland Africa and ten from Madagascar (Kimsey 2009). Hosts are unknown for the subfamily.

**Key to species of *Anthobosca* (modified from Kimsey 2009)**

- 1 Metasoma 6-segmented; ten flagellomeres; females ..... **2**
- Metasoma 7-segmented; eleven flagellomeres; males ..... **4**
- 2 Head, mesosoma and metasoma concolorous brown; wing membrane amber-tinted; body over 25 mm long ..... ***insularis* F. Smith**



- Head, mesosoma and metasoma blackish or blackish and red, often with whitish spots; wing membrane untinted or tinted with brown to black; body length less than 15 mm long..... **3**
- 3 Metasoma black to dark brown, terga II–III with whitish lateral spots ..... *madecassa* **Krombein**
- Metasoma red, terga II–III without lateral spot..... *dimidiata* **Bartalucci**
- 4 Metasomal sterna II and III with large spoon-like ventral projections; metasoma with extensive yellow markings ..... *hallucigenia* **Kimsey**
- Metasomal sterna II and III unmodified, without projections; metasoma without yellow markings..... **5**
- 5 Body length 17–20 mm; wings dark amber-tinted; flagellomeres without tyloids; tegula brown..... *insularis* **F. Smith**
- Body length 11 mm or less; wings untinted; three or more flagellomeres with tyloids; tegula white ..... **6**
- 6 Flagellomere XI less than 2.2× as long as broad..... **7**
- Flagellomere XI more than 2.4× as long as broad..... **10**
- 7 Flagellomere VIII without tyloids; clypeus evenly convex with narrow ventrally facing flattened apical surface..... *micromeria* **Bartalucci**
- Flagellomere VIII with one tyloid; clypeus without ventrally facing flattened apical surface ..... **8**
- 8 Flagellomere VII with one small tyloid ..... *nigrimacula* **Kimsey**
- Flagellomere VII without tyloids..... **9**
- 9 Volsella broadest submedially, dorsal lobe oriented diagonally; paramere apex brown ..... *castanea* **Kimsey**
- Volsella broadest dorsally, dorsal lobe oriented horizontally; paramere apex whitish ..... *toliaraensis* **Kimsey**
- 10 Paramere apex white; flagellum strongly bicolored brown to black dorsally, yellow ventrally; digitus extending diagonally to horizontally toward paramere in profile ..... **11**
- Paramere apex brown; flagellum brown to black, may be slightly paler ventrally; digitus extending diagonally toward paramere in lateral view ..... **12**
- 11 Clypeus evenly convex medially, entirely white or less commonly bicolored, black and white; volsella broadest dorsally, digitus horizontally oriented in lateral view ..... *mahajangaensis* **Kimsey**
- Clypeus flattened medially, entirely brown or bicolored brown and black; volsella narrowed dorsally, digitus oriented obliquely in lateral view..... *namorokaensis* **Kimsey**
- 12 Flagellomere XI 2.6–3.0× as long as broad; digitus diagonally to vertically oriented in lateral view..... *harinhalai* **Kimsey**
- Flagellomere XI 2.3–2.4× as long as broad; digitus horizontally oriented in lateral view ..... *fisheri* **Kimsey**



### Checklist of *Anthobosca* species

1. *castanea* Kimsey 2009:2. Holotype male: Madagascar: Mahajanga Prov., Parc National d'Ankarafantsika, Ampijoroa Station Forestière, 40 km 306° 2nw Andranofasika (SAN FRANCISCO). Distribution: Mahajanga and Toliara Provinces.
2. *dimidiata* Bartalucci 2005:1082. Holotype female; Madagascar: Tuléar Berenti, 12 km nw Amboasary (LONDON). Distribution: Toliara Prov.
3. *fisheri* Kimsey 2009:5. Holotype male: Madagascar: Toliara Prov. Forêt de Mahavelo Isantoria River (SAN FRANCISCO). Distribution: Toliara, Toamasina, Antsiranana and Mahajanga Provinces.
4. *hallucigenia* Kimsey 2009:9. Holotype male: Madagascar: Toamasina Prov., Andasibe National Park (SAN FRANCISCO). Distribution: Antsiranana, Finanarantsoa and Toamasina Provinces.
5. *harinhalai* Kimsey 2009:11. Holotype male: Madagascar: Toliara Prov. Forêt de Mahavelo Isantoria River (SAN FRANCISCO). Distribution: Toliara and Tuléar Provinces.
6. *insularis* (Smith) 1879:178. (*Myzine*). Holotype female; Madagascar (LONDON). Distribution: Ranomafana National Park and adjacent Fianarantsoa Prov.
7. *madecassa* Krombein 1949:52. Holotype female; Madagascar: Bekily (ITHACA). Distribution: Antsiranana and Toliara Provinces.
8. *mahajangaensis* Kimsey 2009:12. Holotype male: Madagascar: Mahajanga Prov., Parc National de Baie de Baly (SAN FRANCISCO). Distribution: Mahajanga Prov.
9. *micromeria* Bartalucci 2005:1083. Holotype male; Madagascar: Tuléar Morondava (LONDON). Distribution: Mahajanga Prov.
10. *namorokaensis* Kimsey 2009:15. Holotype male: Madagascar: Mahajanga Prov., Namoroka National Park, 16.9 km, 317° nw Vilanandro (SAN FRANCISCO). Distribution: Mahajanga Prov.
11. *nigrimacula* Kimsey 2009:16. Holotype male: Madagascar: Toliara Prov., Réserve Spéciale de Cap Sainte Marie (SAN FRANCISCO). Distribution: Toliara Prov.
12. *toliaraensis* Kimsey 2009:16. Holotype male: Madagascar: Toliara Prov., 12 km se Tuléar, (DAVIS). Distribution: Mahajanga and Toliara Provinces.

### Subfamily Tiphinae

#### Genus *Tiphia* Fabricius

<http://species-id.net/wiki/Tiphia>

Fig. 3

**Discussion.** The genus *Tiphia* occurs worldwide, but the majority of species are found in the Northern Hemisphere. Only two species are recorded from Madagascar whereas 29 are known from mainland Africa. Members of the genus are known to parasitize scarab beetle larvae.



*Tiphia* are medium-sized, black wasps. They are characterized by a flat face, incomplete forewing marginal cell, oral fossa and associated hypostomal plate broader than long, male metasomal sternum VI notched apicomediaally, and sternum VII unciform.

### Key to species of *Tiphia*

- Metasomal tergum I with transverse anterodorsal carina ... ***bisinuata* Saussure**  
 Metasomal tergum I without transverse carina ..... ***saussurei* Krombein**

### Checklist of *Tiphia* species

1. *bisinuata* Saussure 1890:236. Syntype females; Madagascar (GENEVA?, unverified).
2. *saussurei* Krombein 1949: 54. Holotype; Madagascar: Fianarantsoa (WASHINGTON). Distribution: Fianarantsoa and Toliara Provinces.

## Subfamily Myzininae

### Genus *Meria* Illiger

<http://species-id.net/wiki/Meria>

Fig. 5

*Meria* Illiger 1807:194.

**Type species:** *Tiphia tripunctata* Rossi 1790. Monobasic.

**Discussion.** This is a widespread genus found throughout the Palearctic and Afrotropical Regions. *Meria* species are sexually dimorphic, as are members of the genera *Mesa* and *Myzinella*. Males are elongate and slender with straight, cylindrical antennae. Females are heavy-bodied, with coiled antennae. Males also have the distinctive hook-like apical metasomal sternum (uncus) found in other myzinines. *Meria* males can be distinguished from *Mesa* and *Myzinella* by the short, broad metasomal sternum I and petiolate forewing submarginal cell. Hosts are unknown.

### Key to species of *Meria* (males)

- 1 Scape with densely pitted band on upper surface extending to apex; volsella with strong processes on inner surface..... ***luteipes* Bartalucci**
- Scape without densely pitted band on upper surface extending to apex; volsella without processes on inner surface..... **2**
- 2 Anterior margin of scutum thickened, elevated; metasoma strongly constricted between segments..... ***gradilis* Bartalucci**
- Anterior margin of scutum not thickened or elevated; metasoma not strongly constricted between segments ..... ***vonizongo* Krombein**



### Checklist of *Meria* species

1. *gradilis* Bartalucci 2005:1087. Holotype male; Madagascar: Toliara, Toliara-Sakaraha Flusstal, 9 km vor Sakaraha (VIENNA). Distribution: Toliara Prov.
2. *luteipes* Bartalucci 2005:1086. Holotype male; Madagascar: Toliara, Toliara-Sakaraha Flusstal, 9 km vor Sakaraha (VIENNA). Distribution: Toliara Prov.
3. *vonizongo* Krombein 1949:57. Holotype male; Madagascar: Tananarive (ITHACA). Distribution: Fianarantsoa and Toliara Provinces.

### Genus *Mesa* Saussure

<http://species-id.net/wiki/Mesa>

Fig. 4

*Mesa* Saussure 1890:244.

**Type species:** *Mesa heterogamia* Saussure 1890, designated by Krombein 1937.

**Discussion.** The genus *Mesa* is found from the Afrotropical Region, including Madagascar, north and east into Iran and Myanmar. *Mesa* males are characterized by having metasomal segment I more than three times as long as broad and the terga without a transverse subbasal carina or ridge. Hosts are unknown for the genus.

Although Bartalucci (2005) removed *Mesa hova* (Turner) from synonymy under *nodosa* (Guérin de Meneville 1837) he did not clearly describe the male and it is unclear, which male is associated with the female type of *hova*.

### Key to species of *Mesa* (males)

- 1 Metasomal sternum I basally with narrow punctate groove, margined with longitudinal carinae; clypeal apex and some metasomal terga with whitish markings.....***saussurei* (Turner)**
- Metasomal tergum I basally evenly convex, without longitudinal carinae or groove; clypeus and metasoma entirely black ..... **2**
- 2 Tegula and tibiae with some whitish markings; body 13 mm long or shorter; propodeal posterior face densely punctuate, not rugose.....***nodosa* (Guérin de Meneville)**
- Tegula and tibiae without whitish markings; body longer than 15 mm; propodeal posterior face rugosopunctate ..... **3**
- 3 Paramere broadest apically, apically truncate; cuspis inner surface with scale-like setae .....***krombeini* Bartalucci**
- Paramere broadest submedially or subapically, tapering apically; cuspis inner surface without scale-like setae..... **4**
- 4 Pygidium delimited by lateral carina extending two-thirds distance from apex to exposed base; metepimeron rugulose; paramere apically hooked .....***tandrona* Krombein**



- Pygidium delimited by lateral carina extending less than half distance from apex to exposed base; metepimeron smooth; paramere not apically hooked..... 5
- 5 Pygidium apical emargination shallow, broad, twice as wide as deep; foretibia reddish, with whitish marks basally and apically ..... *marovatana* Krombein
- Pygidium apical emargination deep, narrow, nearly as deep as wide; foretibia red, without whitish markings ..... *madecassa* Krombein

### Checklist of *Mesa* species

1. *hova* (Turner) 1908:504. (*Plesia*). Holotype female; Madagascar: Tamatave (LONDON). Synonymized by Krombein 1949. Removed from synonymy under *nodosa* by Bartalucci 2005. Distribution: Antsiranana, Finanarantsoa, Mahajanga and Toliara Provinces.
2. *krombeini* Bartalucci 2005:1086. Holotype male; Madagascar: Tananarive (ITHACA). Based on paratype males of *seyrigi* Krombein 1949. Distribution: Antanarivo and Toliara Provinces.
3. *madecassa* Krombein 1949:66. Holotype male; Madagascar: Bekily (ITHACA). Distribution: Fianarantsoa Prov.
4. *marovatana* Krombein 1949:68. Holotype male; Madagascar: Tananarive (ITHACA). Distribution: Antsiranana, Fianarantsoa, Mahajanga, Toliara Provinces.
5. *nodosa* (Guérin Méneville) 1837:584. (*Myzine*). Lectotype male (designated by Bartalucci 2005); Madagascar, Goudot (PARIS). Distribution: Antsiranana, Fianarantsoa Provinces.
6. *saussurei* (Turner) 1910:394. (*Plesia*). Holotype female; Madagascar: Tananarive (BERLIN). Distribution: Diego Suarez, Mahajanga, Toamasina and Toliara Provinces.
7. *tandrana* Krombein 1949:69. Holotype male; Madagascar: Vallée de Rivière Sambirano (ITHACA). Distribution: Antsiranana, Fianarantsoa and Toliara Provinces.

### Genus *Myzinella* Guiglia

<http://species-id.net/wiki/Myzinella>

Fig. 6

*Myzinella* Guiglia 1959:2.

**Type species:** *Myzinella patrizii* Guiglia 1959. Original designation.

**Discussion.** Bartalucci (2005) published the first record of *Myzinella* from Madagascar, although the genus is known from mainland Africa, India and Iran. A second, new species, *minima*, was present in the materials examined for this review from the California Academy of Sciences Madagascar project and is described below.

The most distinctive features of male *Myzinella* are the abruptly up curved uncus, short, nodose metasomal tergum I, metasomal terga III–VII with an abruptly elevated



transverse ridge or flange separating the smooth anterior surface that slides beneath the preceding tergum from the tergal disk and the subapical metasomal sternum is broadly truncate apically.

**Hosts:** unknown for the genus.

### Key to species of *Myzinella* (males)

Metasomal segment I red; tegula with posterior depression; flagellum not apically dilated, apical flagellomere more than twice as long as broad .....

..... *festiva* Bartalucci

Metasomal segment I black; tegula evenly rounded; *flagellum* apically dilated, apical flagellomere less than twice as long as broad..... *minima* sp. n.

### *Myzinella minima* sp. n.

[urn:lsid:zoobank.org:act:E721E65B-DC86-4CCF-8CA9-3B45A0D06D56](http://urn:lsid:zoobank.org:act:E721E65B-DC86-4CCF-8CA9-3B45A0D06D56)

[http://species-id.net/wiki/Myzinella\\_minima](http://species-id.net/wiki/Myzinella_minima)

Figs 6–8

**Holotype male:** Toliara Prov., Réserve Spéciale de Cap Sainte Marie, 14.9 km 261° W Marovato, 160m, 13–19/ii/2002 25°35'40"S 45°8'49"E, Fisher, Griswold et al., pitfall trap in spiny forest thicket, BLF5650 (CAS).

**Paratypes** (8 males): 5 males, same data as holotype; 2 males: 12.3 km 262° w Marovato, 200m, 11–15/ii/2002, 25°34'54"S 45°10'6"E, Fisher, Griswold et al., Malaise trap in spiny forest thicket, BLF5504; 1 male: Tuléar [Toliara] Prov., Ifaly 22 km north Tuléar, 23°11'S 43°37'E, 18/iv/1998, 30 m, swept from beach dunes, M. E. Irwin & E. I. Schlinger, Schlinger Foundation Expedition (DAVIS, SAN FRANCISCO).

**Diagnosis.** *Myzinella minima* can be readily distinguished from *Myzinella festiva* by the black metasomal segment I, evenly convex and ovoid tegula and apically thickened antenna. *Myzinella minima* is also smaller than *festiva*, which ranges from 10–12 mm long.

**Description.** Male (Fig. 6).

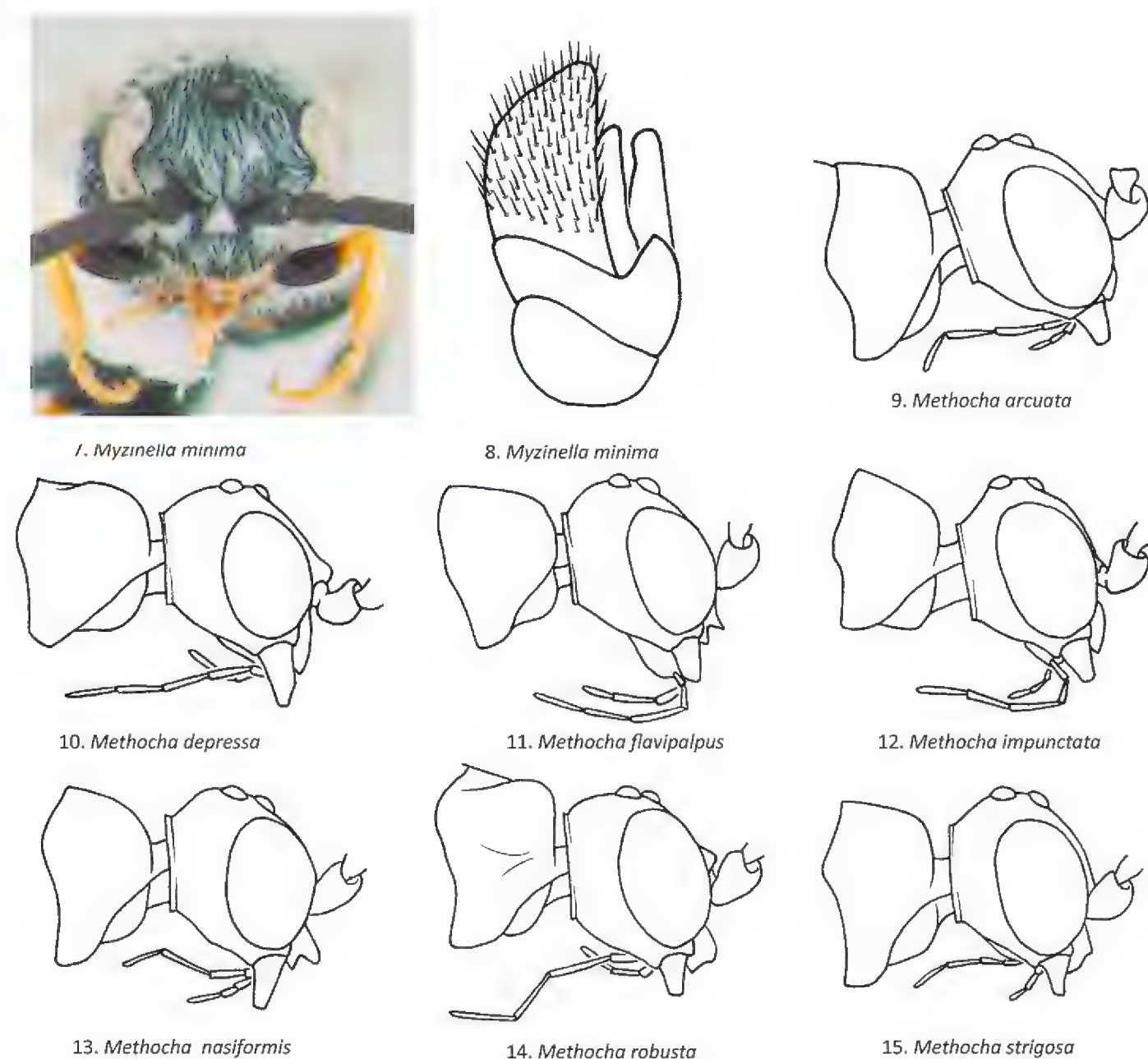
*Body length.* 5–8 mm.

*Face* (Fig. 7). Oral cavity unmodified; genal bridge opaque, barely covering the tongue base; vertex impunctate between hindocellus and eye, except for single row of punctures along eye margin; flagellomere I twice as long as broad; flagellomeres II and III 1.7× as long as broad; flagellomere XI 1.4× as long as broad, apical flagellar segments twice the breadth of basal segments.

*Thorax.* Pronotum more than twice as broad as long; metasomal dorsum and mesopleuron with punctures separated by 0.5–2.0 puncture diameters; tegula ovoid, evenly convex; forewing apical cells separated from wing apex by more than length of discoidal cell.

*Metasoma.* Tergum I highly polished, punctures 2–4 or more puncture diameters apart; terga I–VII polished with punctures 2–4 puncture diameters apart; tergum VII





**Figures 7–15.** Front view of face. **8** Lateral view genital capsule **9–15** Lateral view of head and pronotum.

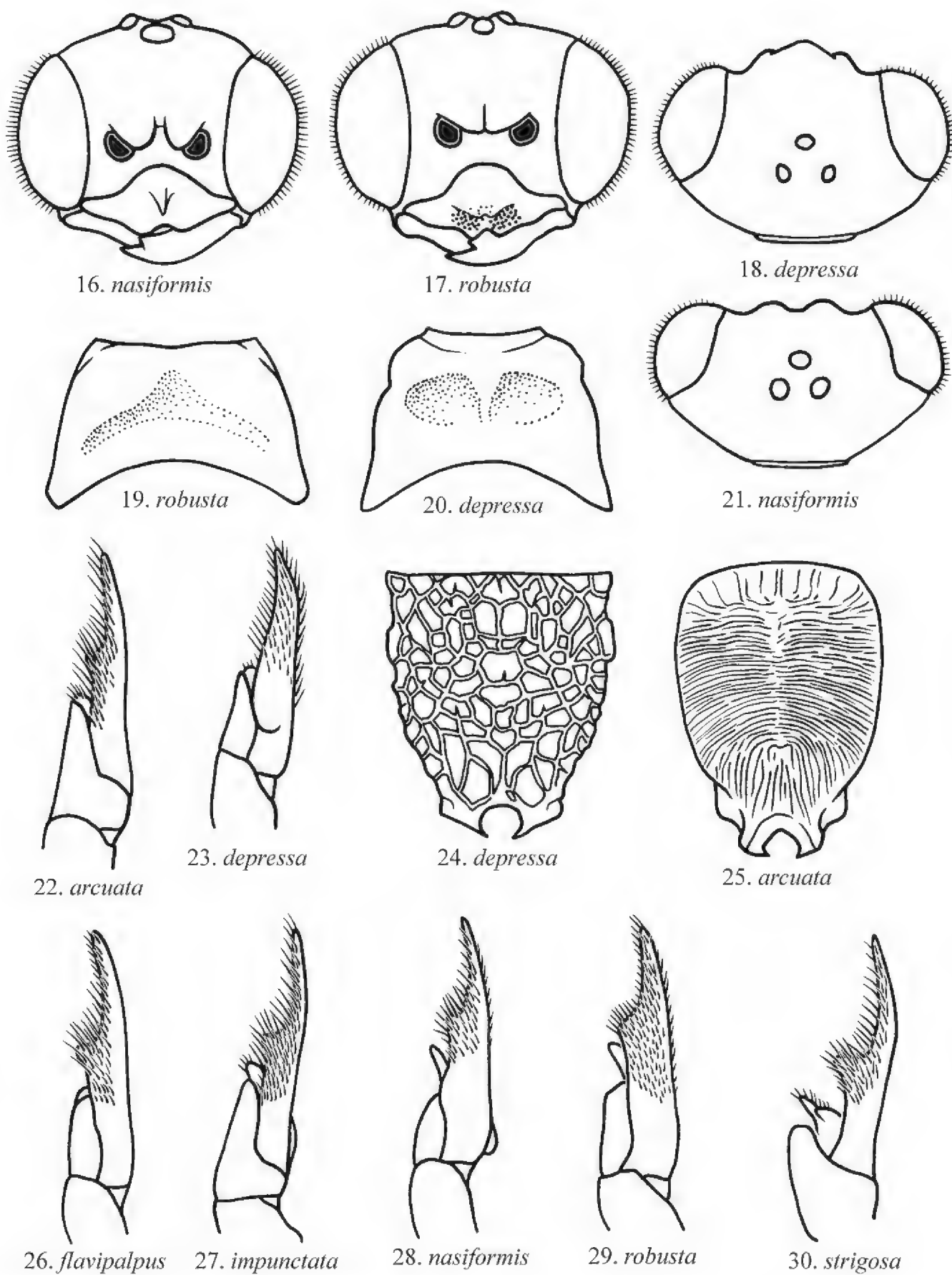
apically acute on either side of apicomedial notch; sternum I with punctures 1–2 puncture diameters apart; sterna II–V with transverse medial and apical bands of punctures; sternum VI impunctate, except for medial patch of punctures.

*Genitalia* (Fig. 8). Paramere 1.5× as long as broad, broadly curved dorsally with blunt apex; aedeagus simple, linear two-thirds as long as paramere; volsellar simple, apex rounded.

*Color.* Black, with pale yellow markings, mandibles pale yellow, pronotum with yellow transverse band, tegula pale yellow, femoral apices, tibiae partly and tarsi completely yellow, metasomal terga II–VI with medial and lateral yellow spots, tergum I with short transverse yellow band along posterior margin; wing veins whitish basally, black apically and medially, wing membrane whitish.

*Vestiture.* Long white, largely decumbent.





**Figures 16–30.** *Methocha* species. **16, 17** Front view of face **18, 21** Dorsal view of head **19, 20** Dorsal view of pronotum **22, 23, 26–30** Lateral view of genital capsule **24, 25** Posterior view of propodeum.

### Checklist of *Myzinella* Species

1. *festiva* Bartalucci 2005:1088. Holotype male; Madagascar: Tuléar, Tuléar Morombe Pk. (VIENNA). Distribution: Toliara Prov.
2. *minima* sp. n. Distribution: Toliara Prov.



## Subfamily *Methochinae*

### Genus *Methocha* Latreille

<http://species-id.net/wiki/Methocha>

Figs 9–30

**Discussion.** Members of the genus *Methocha* are distinctive wasps. Females are wingless and ant-like. Males are slender and elongate with exerted parameres that protrude as far as the uncus. There are 16 species of *Methocha* in continental Africa, and ten Malagassy species, nine based on males and one species, *cambonini* Saussure, based on females. These wasps are known to be parasites of cicindellid beetles.

### Key to species of *Methocha* (males)

- 1 Pronotal disk strongly depressed posterior to anterior margin (as in Figs 19, 20) ..... **2**
- Pronotal disk not depressed posterior to anterior margin ..... **3**
- 2 Pronotal disk depressed on either side of medial longitudinal elevation (Fig. 20); frons produced into medial angular projection just above suprantennal projections (Fig. 18) ..... ***depressa* sp. n.**
- Pronotal disk without medial longitudinal elevation (Fig. 19); frons not produced into medial projection or medial projection rounded.... ***robusta* sp. n.**
- 3 Clypeal deeply apicomediaally emarginate; suprantennal projections broadly rounded separated by broadly obtuse, shallow medial depression; parategula yellow; legs usually yellow to reddish ..... ***lambertoni* Krombein**
- Clypeal apex truncate or slightly concave; suprantennal projections strongly convex separated by narrow, acute medial depression; parategula entirely black, brown or bicolored; legs brown to black or yellow ..... **4**
- 4 Clypeus with acute to digitate medial projection (as in Figs 11, 13, 15) ..... **5**
- Clypeus broadly convex, without acute or digitate medial projection (as in Figs 9, 10, 12) ..... **7**
- 5 Parategula yellowish brown to brown with transparent margin; clypeal apical margin emarginate; mandible yellow; legs yellow to yellowish brown ..... ***flavipalpus* sp. n.**
- Parategula opaque, evenly black to dark brown; clypeal apical margin linear or shallowly emarginate, mandible dark reddish brown to black; legs dark brown to black ..... **6**
- 6 Propodeum covered with coarse contiguous punctures ..... ***nasiformis* sp. n.**
- Propodeum covered with fine transverse parallel ridges (similar to Fig. 25) .... ***strigosa* sp. n.**
- 7 Flagellomere I twice as long as broad, flagellomere II 3× as long as broad; antennal lobes strongly produced, medially forming parallel-sided or apically narrowed notch ..... ***arnoldi* Krombein**



- Flagellomere I less than twice as long as broad, flagellomere II twice as long as broad; antennal lobes weakly or strongly produced, forming obtuse medial notch ..... **8**
- 8 Propodeum covered with dense, fine ridges, dorsally and ventrally arcuate (Fig. 25) ..... ***arcuata* sp. n.**
- Propodeum polished, nearly impunctate, without more than traces of ridges ..... ***impunctata* sp. n.**

***Methocha arcuata* sp. n.**

[urn:lsid:zoobank.org:act:C8488898-9AFB-4D40-9D88-802E4D93283E](http://zoobank.org/urn:lsid:zoobank.org:act:C8488898-9AFB-4D40-9D88-802E4D93283E)

[http://species-id.net/wiki/Methocha\\_arcuata](http://species-id.net/wiki/Methocha_arcuata)

Figs 9, 22, 25

**Holotype male:** Fianarantsoa Prov., Parc Natl. Ranomafana, radio tower at forest edge, 1130 m, 14–21/i/2002, 21°5'05S 47°24'43E, R. Harin'Hala, malaise, mixed tropical forest, MA-02-09B-12 (SAN FRANCISCO).

**Paratypes** (8 males): 1 male: 23/v–3/vi/2002, MA-02-09C-30; 1 male: Belle Vue at Talatakely, 1020 m 23–28/iv/2002, 21°15'99S 47°25'21E. R. Harin'Hala, malaise, secondary tropical forest, MA-02-09C-26; 2 males: JIRAMA water works, 10–14/i/2002, 21°14'91S 47°27'13E, R. Harin'Hala, MT nr river, 690 m, MA-02-09D-11; 1 male: Antsiranana Prov., Parc Natl. Montagne d'Ambre, 1125m, 14–30/v/2001, 12°31'13S 49°10'45E, R. Harin'Hala, MT, MA-01-01D-11; 1 male: Toamasina Prov., Montagne d'Anjanaharibe, 18.0 km 21° nnw Ambinanitelo, 470m, 8–12/iii/2003, 15°11'18S 049°36'54E, Fisher, Griswold et al. MT, in rainforest, BLF8011 (DAVIS).

**Diagnosis.** The most distinctive features of *arcuata* are the flattened clypeus, well-developed antennal lobes and propodeal sculpturing consisting of fine transverse to dorsally arcuate ridges. This species most closely resembles *arnoldi* but can be distinguished by the longer flagellomeres and the finely ridged propodeum.

**Description.** Male.

*Body length.* 7–11 mm.

*Head.* Clypeus flattened medially (Fig. 9), apex truncate; antennal lobes rounded; frons without medial projection or lobe above antennal sockets; frons and vertex punctures separated by 1–2 puncture diameters; flagellomere I twice as long as broad; flagellomeres II and III 2.6–2.7× as long as broad; flagellomere XI 4× as long as broad.

*Mesosoma.* Pronotal disk gently convex medially, shoulders evenly rounded; scutal punctures separated by 1 puncture diameter, except for less densely punctate medial area; scutellum nearly impunctate; mesopleuron highly polished with tiny sparse punctures, more than 4 puncture diameters apart; propodeum with dense, fine ridges, dorsally and ventrally arcuate (Fig. 25).

*Metasoma.* Terga highly polished, punctures tiny and separated by 4 or more puncture diameters; sterna impunctate except for basal band of punctures 1 puncture diameter apart.



**Genitalia** (Fig. 22). Paramere slender, with small medial angle, marked by transparent lobe, breadth at medial angle 2.0–2.3× breadth at halfway point between apex and medial angle, paramere length versus breadth at submedial angle is 6×.

**Color.** Black, with pale yellow mandibles and fore and midcoxae, fore and mid legs may be yellowish brown; palpi whitish; wing membrane faintly brown-tinted apically.

**Vestiture.** Sparse erect, silvery.

***Methocha depressa* sp. n.**

[urn:lsid:zoobank.org:act:32899954-9905-484D-BD83-23FF9B99B049](http://urn:lsid:zoobank.org:act:32899954-9905-484D-BD83-23FF9B99B049)

[http://species-id.net/wiki/Methocha\\_depressa](http://species-id.net/wiki/Methocha_depressa)

Figs 10, 18, 20, 21, 23

**Holotype male:** Fianarantsoa Prov., Parc Natl. Ranomafana, Belle Vue at Talatakely, 1020 m, 12–19/ii/2002, 21°15'99S, 47°25'21E, R. Harin'Hala, Malaise trap, secondary tropical forest, MA-02-09C-16 (SAN FRANCISCO).

**Paratypes** (12 males): 9 males: same data as holotype; 1 male: 12–23/iv/2003, MA-02-09C-58; 4 males: 16/x–8/xi/2001, MA-02-09C-01; 1 male: 22–28/xi/2001 MA-02-09C-04; 1 male: 10–14/i/2002, MA-02-09C-11; 1 male: 23–28/iv/2002, MA-02-09C-26; 1 male: 28/iv–5/v/2002, MA-02-09C-27; 4 males: 23/v–3/vi/2002, MA-02-09C-30; 1 male: 13–23/vi/2002, MA-02-09C-32; 1 male: 10–21/iii/2003, MA-02-09C-56; 1 male: 21/iii–12/iv/2003, MA-02-09C-57; 1 male: 28/v–6/vi/2003, MA-02-09C-62; 2 males: JIRAMA water works, 21–24/xii/2001, 21° 14.91'S, 47° 27.13'E colr. R. Harin'Hala CAS MT nr river 690 m, MA-02-09D-08; 1 male: 2–10/i/2002, MA-02-09D-10; 3 males: radio tower at forest edge, 1130 m, 14–21/i/2002 21°15'05S, 47°24'43E, R. Harin'Hala, Malaise trap, mixed tropical forest, MA-02-09B-12; 2 males: 12–19/ii/2002, MA-02-09B-16; 1 male: 12–19/iii/2002, MA-02-09B-20; 3 males: 24/v–4/vi/2002, MA-02-09B-30; 1 male: 27/ii–9/iii/2003, MA-02-09B-54; 1 male: 9–20/iii/2003, MA-02-09B-55; 1 male: 29/vi/–6/vii/2003 2,1 MA-02-09B-65; 2 males: 6–17/vii/2003, MA-02-09B-66; 1 male: Vohiparara, at broken bridge, 1110 m, 21°13'57S, 47°22'19E, R. Harin'Hala, Malaise trap in high altitude rainforest, 25/vii–3/viii/2002, MA-02-09A-36; 3 males: 6–15/xii/2001, MA-02-09A-061 male: 15–21/xii/2001, MA-02-09A-07; 3 males: 21–28/i/2002, MA-02-09A-13; 2 males: 26–31/iii/2002 21, MA-02-09A-22; 7 males: 1 male: Antsiranana Prov., Parc Natl Montagne d'Ambre, 1125m, 14–30/v/2001 12°31'13S 49°10'45E, R. Harin'Hala, MT MA-01-01D-11; 1 male: Forêt de Binara, 7.5 km 230° sw Daraina, 375m, 1/xii/2003, 13°15'18S 049°37'00E, B. L. Fisher, MT tropical dry forest, BLF9557 (DAVIS, SAN FRANCISCO).

**Diagnosis.** The most distinctive features of *depressa* are the coarsely areolate propodeum, the shape of the frontal projection above and between the antennal lobes and the sublaterally impressed pronotal disk. This species does not closely resemble any of the other Malagasy *Methocha* species, although the depressed pronotum resembles that of *robusta*, which differs in having the pronotal depression interrupted medially.



**Description.** Male.

*Body length.* 5–7 mm.

*Head.* Clypeus with obtuse medial projection (Fig. 10), apex linear or shallowly emarginate; antennal lobes rounded; frons with strong medial projection or lobe above antennal sockets (Fig. 18); frons and vertex punctures separated by 1–2 puncture diameters; scapal carina less than half length of scape; flagellomere I 1.7× as long as broad; flagellomere II 2.5× as long as broad; flagellomere III 2.8× as long as broad; flagellomeres IV–X arcuate; flagellomere XI 5× as long as broad.

*Mesosoma.* Pronotal disk strongly depressed on either side of elevated midline posterior to anterior margin, shoulders evenly rounded (Fig. 18); scutal punctures separated by 1 puncture diameter, except for less densely punctate medial area; scutellum nearly impunctate; mesopleural punctures 1–2 puncture diameters apart; propodeum with coarse, contiguous areolae (Fig. 24).

*Metasoma.* Terga highly polished, punctures tiny and separated by 4 or more puncture diameters; sternum I punctures 1 puncture diameter apart; sterna II–V anteriorly with contiguous punctures, separated from posterior part by punctulate transverse groove, posteriorly strongly convex, punctures 1–2 puncture diameters apart.

*Genitalia* (Fig. 23). Paramere breadth at medial angle 1.5× breadth at halfway point between apex and medial angle, paramere length versus breadth at submedial angle is 6×.

*Color.* black; clypeus sometimes partly reddish brown; mandibles reddish; palpi yellow to pale brown; parategula black; legs dark brown to black; palpi whitish; wing membrane untinted apically.

*Vestiture.* Sparse erect, silvery.

***Methocha flavipalpus* sp. n.**

[urn:lsid:zoobank.org:act:F42DF972-75A7-447F-8C50-A7E2971BF6F3](http://zoobank.org/urn:lsid:zoobank.org:act:F42DF972-75A7-447F-8C50-A7E2971BF6F3)

[http://species-id.net/wiki/Methocha\\_flavipalpus](http://species-id.net/wiki/Methocha_flavipalpus)

Figs 11, 26

**Holotype male:** Mahajanga Prov. Parc Natl. Tsingy de Bemaraha, 10.6 km ese 123° Antsalova, 150m, 16–20/xi/2001, 19°42'34S 44°43'5E, Fisher, Griswold et al., MT, tropical dry forest on Tsingy, BLF4462 (SAN FRANCISCO).

**Paratypes:** (10 males) 6 males: same data as holotype; 1 male: 2.5 km 62° ene Bekopaka, Ankidrodra River, 100m, 11–15/xi/2001, 19°07.56S 44°48.53E, Fisher, Griswold et al., MT-tropical dry forest on Tsingy, BLF4345; 1 male: Mahavavy River, 6.2 km 145° se Mitsinjo, 20m, 1–5/xii/2002, 16°03'06S 045°54'30E, Fisher, Griswold et al., MT in gallery forest, BLF6930; 1 male: 3.4 km 93° e Bekopaka, Tombeau Vazimba, 50m, 6–10/xi/2001, 19°8'31S 44°49'41E, Fisher, Griswold et al., MT, in tropical dry forest, BLF4233; 1 male: Forêt Ambohimanga, 26.1 km 314° Mampikony, 250 m, 13/xii/2004, 15°57.46S 047°6.17E, B. L. Fisher, MT tropical dry forest, BLF11670; 1 male: Toliara Prov. Rés. Spéciale d'Ambohijanahary, Forêt d'Ankazotsihitafootra, 35.2



km 312° nw Ambaravarana, 1050 m, 13–17/i/2003, 18°16'00S 045°24'24E, Fisher, Griswold et al., MT-montane rainforest, BLF7023 (DAVIS, SAN FRANCISCO).

**Diagnosis.** *Methocha flavipalpus* resembles *nasiformis* and *strigosa* based on the strong medial clypeal projection. It can be distinguished from those species by the coloration of the parategula, which has a transparent margin and the yellowish mandibles, palpi and legs; all black to dark or reddish brown in *nasiformis* and *strigosa*.

**Description.** Male.

*Body length.* 9–11 mm.

*Head.* Clypeus with acute to digitate medial projection (Fig. 11), apical margin emarginate; antennal lobes strongly convex; frons without medial projection or lobe above antennal sockets; frons punctures separated by 1 puncture diameter; vertex nearly impunctate; scapal ridge two-thirds length of scape; flagellomere I 1.7× as long as broad; flagellomere II 2.2× as long as broad; flagellomeres II and III 2.4× as long as broad; flagellomeres III–X arcuate; flagellomere XI 5× as long as broad.

*Mesosoma.* Pronotal disk gently convex medially, shoulders rounded, punctures large nearly contiguous; scutal punctures contiguous sublaterally becoming sparser medially; scutellum punctures 1–3 puncture diameters apart; mesopleuron with punctures separated by 1–2 puncture diameters apart; propodeum with coarse, contiguous, transversely striatiform punctures.

*Metasoma.* Terga polished, punctures separated by 1–2 puncture diameters; sterna I and VI with punctures separated by 1–2 puncture diameters; sterna II–V basally with punctures separated by 1 puncture diameter, separated from posterior part by smooth, transverse groove, posteriorly convex, with punctures separated by 2–4 puncture diameters.

*Genitalia* (Fig. 26). Paramere breadth at medial angle 3.0–3.3× breadth at halfway point between apex and medial angle, paramere length versus breadth at submedial angle is 4.6×.

*Color.* Black; mandibles and palpi whitish to yellow; fore and midcoxae may be pale brown, fore and mid legs brown with paler joints and tarsi; parategula bicolored, brown and whitish with transparent margin; wing membrane untinted, except posterior margin slightly brown-tinted in some specimens.

*Vestiture.* Sparse erect, silvery.

***Methocha impunctata* sp. n.**

[urn:lsid:zoobank.org:act:635024DC-85DE-4BD7-B527-1EE0A1D566FA](https://zoobank.org/act:635024DC-85DE-4BD7-B527-1EE0A1D566FA)

[http://species-id.net/wiki/Methocha\\_impunctata](http://species-id.net/wiki/Methocha_impunctata)

Figs 12, 27

**Holotype male:** Toamasina Prov., Andasibe NP, 1–7/xi/2001, 18°55'58S 48°24.47E, R. Harin'Hala colr., Malaise trap, 1025 m, MA-01-08B-18 (SAN FRANCISCO).

**Diagnosis.** The highly polished, largely impunctate and unsculptured body is the most distinctive feature of *impunctata*. The unsculptured propodeum will immediately



separate it from *arcuata*, which shares the largest number of characteristics with *impunctata*.

**Description.** Male.

*Body length.* 8 mm.

*Head* (Fig. 12). Clypeus flattened medially, apical margin at most slightly concave; antennal lobes rounded; frons without medial projection or lobe above antennal sockets; frons punctures 1 puncture diameter apart; vertex punctures tiny, separated by 2–4 puncture diameters; scapal ridge two-thirds length of scape; flagellomere I 1.4× as long as broad; flagellomeres II–III twice as long as broad; flagellomeres IV–X arcuate; flagellomere XI 4× as long as broad.

*Mesosoma.* Pronotal disk gently convex medially, shoulders evenly rounded, punctures 0.5–1.0 puncture diameter apart; scutal punctures contiguous to 1 puncture diameter apart, except for less dense medial area; scutellum, mesopleuron and propodeum highly polished, nearly impunctate.

*Metasoma.* Terga and sterna highly polished, nearly impunctate, subbasal sternal groove smooth impunctate.

*Genitalia* (Fig. 27). Paramere breadth at medial angle 3.0–3.3× breadth at halfway point between apex and medial angle, paramere length versus breadth at submedial angle 6×.

*Color.* Black; mandibles and palpi brown; legs dark brown; parategula black; wing membrane untinted.

*Vestiture.* Sparse erect, silvery.

***Methocha nasiformis* sp. n.**

[urn:lsid:zoobank.org:act:27D7C1EB-73EA-441B-B0ED-B7AC1DE25F39](http://zoobank.org/act:27D7C1EB-73EA-441B-B0ED-B7AC1DE25F39)

[http://species-id.net/wiki/Methocha\\_nasiformis](http://species-id.net/wiki/Methocha_nasiformis)

Figs 13, 16, 21, 28

**Holotype male:** Fianarantsoa, Parc Natl. Ranomafana, radio tower at forest edge, 1130 m, 4–12/ii/2002, 21°15.05'S, 47°24.43'E, R. Harin'Hala, Malaise trap, mixed tropical forest, MA-02-09B-15 (SAN FRANCISCO).

**Paratypes** (5 males): 1 male: same data as holotype; 1 male: 29/vi/– 6/vii/2003, MA-02-09B-65; 1 male: 4–12/ii/2002, 21°15'05S 47°24'43E, R. Harin'Hala, malaise, mixed tropical forest, MA-02-09B-15; 1 male: Belle Vue at Talatakely, 1020 m, 28/iv/–5/v/2002, 21°15.99S 47°25'21E, R. Harin'Hala, malaise, secondary tropical forest, MA-02-09C-27; 1 male: Antsiranana Prov., Parc Natl. de Marojejy, Manantenina River, 28 km 38° ne Andapa, 8.2 km 333° nnw Manantenina, 450m, 12–25/xi/2003, 14°26'12S 049°46'30E, B. L. Fisher et al, MT in rainforest, BLF8723; 1 male: Parc Natl Montagne d'Ambre, 1125m, 14–30/v/2001 12°31'13S 49°10'45 E, R. Harin'Hala, MT, MA-01-01D-11 (DAVIS, SAN FRANCISCO).

**Diagnosis.** *Methocha nasiformis* is one of three species with an acute or even digitate medial clypeal projection. It can be distinguished from *flavipalpus* by the black,

concolorous parategula, dark legs and nearly straight apical clypeal margin (features shared with *strigosa*). It can be distinguished from *strigosa* by the coarsely punctate, not finely ridged propodeum.

**Description.** Male.

*Body length.* 7–13 mm.

*Head.* Clypeus projecting into acute sometimes digitate medial projection (Fig. 13), apex subtruncate (Fig. 16); antennal lobes rounded; frons without medial projection or lobe above antennal sockets (Fig. 21); frons and vertex punctures separated by 1–2 puncture diameters; scapal ridge more than half length of scape; flagellomere I 1.8× as long as broad; flagellomere II 2.2× as long as broad; flagellomeres II and III 2.5–2.6× as long as broad; flagellomere XI 5× as long as broad.

*Mesosoma.* Pronotal disk gently convex medially, shoulders evenly rounded; scutal punctures separated by 1 puncture diameter, except for less dense medial area; scutellum with punctures 1 puncture diameter apart; mesopleuron highly polished with punctures 2–4 puncture diameters apart; propodeum covered with dense, contiguous punctures, becoming striatiform dorsally, dorsally with transverse ridges becoming U-shaped basally.

*Metasoma.* Terga polished, punctures separated by 2–4 or more puncture diameters; sternum I punctures 1–4 puncture diameters apart; sternum II–VI basal part with punctures 0.5–1.0 puncture diameters apart, separated from posterior convex part by small transverse groove, posterior part with punctures 2–4 puncture diameters apart.

*Genitalia* (Fig. 28). Paramere breadth at medial angle 4.5× breadth at halfway point between apex and medial angle, paramere length versus breadth at submedial angle 5×.

*Color.* Black, with dark red mandibles, scapal carina yellow legs black to dark brown, trochanters sometimes paler; palpi reddish; wing membrane brown-tinted.

*Vestiture.* Sparse erect, silvery.

***Methocha robusta* sp. n.**

[urn:lsid:zoobank.org:act:43F6173E-D6C8-483E-BEA7-CA3D45B86624](https://zoobank.org/act:43F6173E-D6C8-483E-BEA7-CA3D45B86624)

[http://species-id.net/wiki/Methocha\\_robusta](http://species-id.net/wiki/Methocha_robusta)

Figs 1, 14, 17, 19, 29

**Holotype male:** Fianarantsoa Prov., Parc Natl. Ranomafana, radio tower at forest edge, 1130 m 14–21/i/2002, 21°15'05S 47°24'43E, R. Harin'Hala, malaise, mixed tropical forest, MA-02-09B-12 (SAN FRANCISCO).

**Paratypes** (4 males): 1 male: 15–27/iv/2003, MA-02-09B-58; 1 male: Belle Vue at Talatakely, 1020 m, 10–14/i/2002, 21°15'99S 47°25'21E, R. Harin'Hala, malaise, secondary tropical forest, MA-02-09C-11; 1 male: 23/v–3/vi/2002, 21°15'99S 47°25'21E, R. Harin'Hala, malaise, secondary tropical forest, MA-02-09C-30; 1 male: Toamasina Prov., botanic garden nr entrance to Andasibe Natl. Park, 1–7/xi/2001, 18°55'58S 48°24'47E, R. Harin'Hala, MT-tropical forest, 1025 m, MA-01-08B-18 (DAVIS, SAN FRANCISCO).



**Diagnosis.** *Methocha robusta* is one of two species with a medial depressed pronotal disk. It can be distinguished from the other species, *depressa*, by the frons concave between the antennal lobes and the strongly convex clypeus. In addition, the pronotal depression lacks the longitudinal medial elevation seen in *depressa*.

**Description.** Male.

*Body length.* 10–13 mm.

*Head.* Clypeus elevated medially into two broad submedial tubercles (Fig. 17) strongly convex in profile (Fig. 14), apex emarginate, with densely shagreened patch on either side of emargination (Fig. 17); antennal lobes elevated with obtuse depression between; frons without medial projection or lobe above antennal sockets; frons and vertex punctures separated by 1 puncture diameters, becoming nearly impunctate behind ocelli; scapal ridge half scapal length; flagellomere I 2.5× as long as broad; flagellomere II 3× as long as broad; flagellomeres III–X arcuate; flagellomere XI 7–8× as long as broad.

*Mesosoma.* Pronotal disk transversely depressed medially, anterior margin elevated in lateral view, shoulders angulate (Fig. 19); scutal and mesopleural punctures separated by 1 puncture diameter; scutellar punctation sparser, 2–3 puncture diameters apart; propodeum completely coarsely areolate.

*Metasoma.* Terga polished, punctures small separated by 2–4 puncture diameters; sterna I and VI with punctures large, 0.5–1.0 puncture diameters apart; sterna II–V basal area with punctures 0.5–1.0 puncture diameters apart, separated from convex posterior part by punctulate groove, posterior part with punctures tiny and 2–4 puncture diameters apart.

*Genitalia* (Fig. 29). Paramere breadth at medial angle 2.5× breadth at halfway point between apex and medial angle, paramere length versus breadth at submedial angle 4.7×.

*Coloration.* Black, mandibles, scapal carina and palpi red; parategula black, legs black to dark brown fore; wing membrane untinted.

*Vestiture.* Sparse erect, silvery.

***Methocha strigosa* sp. n.**

[urn:lsid:zoobank.org:act:1CC35A15-DEA2-415B-82C8-DB85827712B1](http://zoobank.org/urn:lsid:zoobank.org:act:1CC35A15-DEA2-415B-82C8-DB85827712B1)

[http://species-id.net/wiki/Methocha\\_strigosa](http://species-id.net/wiki/Methocha_strigosa)

Figs 15, 30

**Holotype male:** Fianarantsoa Prov., Ranomofana N.P. 21°16'S 47°27'E, 18/iv/1994, M. Wasbauer (DAVIS).

**Paratypes** (91 males): 4 males: Belle Vue at Talatakely, 1020 m, 21°15.99'S, 47°25.21'E, R. Harin'Hala, Malaise trap, secondary tropical forest, 23–28/iv/2002, MA-02-09C-26; 1 male: 22–28/xi/2001, MA-02-09C-04; 1 male: 10–14/i/2002, MA-02-09C-11; 2 males: 23/v–3/vi/2002, MA-02-09C-30; 1 male: 12–19/ii/2002, MA-02-09C-16; 1 male: 24/vii–4/viii/2002, MA-02-09C-36; 1 male: 16–26/ii/2003,



MA-02-09C-54; 1 male: 12–23/iv/2003, MA-02-09C-58; 1 male: 14–21/i/2002, MA-02-09C-12; 3 males: 26/ii–4/iii/2002, MA-02-09C-18; 2 males: radio tower at forest edge, 1130 m, 21°15'05S, 47°24'43E, R. Harin'Hala, Malaise trap, mixed tropical forest, 9–20/iii/2003, MA-02-09B-55; 1 male: 6–17/vii/2003, MA-02-09B-66; 1 male: 4–12/ii/2002, MA-02-09B-15; 2 males: 15–21/xii/2001, MA-02-09B-07; 1 male: 12–19/iii/2002, MA-02-09B-20; 1 male: 14–24/vi/2002 21, MA-02-09B-32; 2 males: 24/v–4/vi/2002 t, MA-02-09B-30; 1 male: 15–25/vii/2002, MA-02-09B-35; 1 male: 9–20/iii/2003, MA-02-09B-55; 4 males: 29/vi–6/vii/2003, MA-02-09B-65; 1 male: 6–17/vii/2003, MA-02-09B-66; 6 males: Vohiparara, at broken bridge, 1110 m, 25/vii–3/viii/2002, 21°13.57S, 47° 22.19E, R. Harin'Hala, MT in high altitude rainforest, MA-02-09A-36; 1 male: 15–21/xii/2001, MA-02-09A-07; 2 males: 4–12/ii/2002, MA-02-09A-15; 1 male: 26–31/iii/2002, MA-02-09A-22; 2 males: radio tower at forest edge, 1130 m, 17–30/v/2003, 21°5.05S, 47°24.43E, R. Harin'Hala, malaise, mixed tropical forest, MA-02-09B-61; 4 males: 20/iii–3/iv/2003, MA-02-09B-56; 8 males: Montagne d'Anjanaharibe, 18.0 km 21° NNE Ambinanitelo, 470m, 8–12/iii/2003, 15°11'18"S 049°36'54"E, Fisher, Griswold et al., Malaise trap, in rainforest, BLF8011; 15 males: Toamasina Prov., Montagne d'Anjanaharibe, 19.5 km 27° nne Ambinanitelo 1100 m, 12–16/iii/2003, 15°10'42"S 049°38'06"E, Fisher, Griswold et al., Malaise trap, in montane rainforest, BLF8149; 3 males: botanic garden nr entrance to Andasibe Natl. Park, 24/x/–1/xi/2001, 18°55.58S 48°4.47E, R. Harin'Hala, MT-tropical forest, 1025 m, MA-01-08B-17; 1 male: 1–7/xi/2001, MA001-08B-18; 2 males: Antsiranana Parc Natl. de Marojejy, Manantenina River, 28.0 km 38° ne Andapa, 8.2 km 333° nnw Manantenina, 450m, 12–25/xi/2003, 14°26'12S 049° 46'30E, B.L. Fisher et al, MT in rainforest, BLF8723; 1 male: Parc Natl Montagne d'Ambre, 1125m, 14–30/v/2001, 12°31'13S 49°10'45E, R. Harin'Hala, MT, MA-01-01D-11; 5 males: Toliara Prov., Rés. Spéciale d'Ambohijanahary, Forêt d'Ankazotsihitafootra, 35.2 km 312° nw Ambaravarana, 1050m, 13–17/i/2003, 18°16'00S 045°24'24E, Fisher, Griswold et al., MT-montane rainforest, BLF7023; 1 male: Forêt Classée d'Analavelona, 29.2 km 343° nnw Mahaboboka, 1100m, 18–22/ii/2003, 22°40'30S 044°11'24E, Fisher, Griswold et al., MT, in montane rainforest, BLF7818; 4 males: Mahajanga Prov., Parc Natl. Tsingy de Bemaraha, 3.4 km 93° e Bekopaka, Tombeau Vazimba, 50m, 6–10/xi/2001, 19°8'31S 44°49'41E, Fisher, Griswold et al., MT, in tropical dry forest, BLF4233; 3 males: Diego Suarez Prov., PN Montagne d'Ambre, 1125 m, 12°31'13S 49°10'45E, 14–30/v/2001, R. Harin'Hala, MT, MA01-01D-11 (DAVIS, SAN FRANCISCO).

**Diagnosis.** *Methocha strigosa* is one of three species, including *nasiformis* and *flavipalpus* with an acute to digitate medial clypeal projection as discussed under *nasiformis*. It can be distinguished from those species by the dark coloration and propodeum covered fine transverse ridges.

**Description.** Male.

*Body length.* 6–11 mm.

*Head.* Clypeus forming obtuse angle medially (Fig. 15), apex linear or shallowly emarginate; antennal lobes well-developed, with narrow, deep notch between; frons



with/without medial projection or lobe above antennal sockets; frons and vertex punctures separated by 1–4 puncture diameters; scapal ridge two-thirds length of scape; flagellomere I 1.8× as long as broad; flagellomere II 2.2× as long as broad; flagellomere III 2.2× as long as broad; flagellomeres III–X arcuate; flagellomere XI 5× as long as broad.

*Mesosoma.* Pronotal disk transversely striatiform anteriorly, evenly convex medially, shoulders evenly rounded, punctures separated by 0.5–2.0 puncture diameters; scutal punctures separated by 0.5–1.0 puncture diameter, becoming less dense medially; scutellum and mesopleuron highly polished, punctation 4–5 puncture diameters apart or more; propodeum covered with dense fine, transverse ridges, becoming U-shaped dorsally.

*Metasoma.* Terga highly polished, punctures tiny separated by 4–5 puncture diameters; sterna highly polished, with smooth subapical transverse groove, punctures anterior to groove 1 puncture diameter apart, posterior to groove 4–5 puncture diameters.

*Genitalia* (Fig. 30). Paramere breadth at medial angle 2.2–2.5× breadth at halfway point between apex and medial angle, paramere length versus breadth at submedial angle 4.6×.

*Color.* Black, with red to brown mandibles; legs black to dark brown becoming paler brown on tarsi in some specimens; palpi yellow; parategula black, without transparent margin; wing membrane untinted or slightly brown tinted.

*Vestiture.* Sparse erect, silvery.

### Checklist of *Methocha* Species

1. *arcuata* sp. n. Distribution: Fianarantsoa Province.
2. *arnoldi* Krombein 1949:72. Holotype male; Madagascar: near Rogez (Krombein, on loan to WASHINGTON). Distribution: Antsiranana, Fianarantsoa, Mahajanga, Toliara and Toamasina Provinces.
3. *cambonini* (Saussure) 1891:259. (*Methoca*). Holotype female; Madagascar (GENEVA).
4. *depressa* sp. n. Distribution: Fianarantsoa Province.
5. *flavipalpus* sp. n. Distribution: Mahajanga, Toliara Provinces.
6. *impunctata* sp. n. Distribution: Toamasina Province.
7. *lambertoni* Krombein 1949:73. Holotype male; Madagascar: near Rogez, (Krombein, on loan to WASHINGTON). Distribution: Antsiranana, Fianarantsoa, Mahajanga, Toamasina and Toliara Provinces.
8. *nasiformis* sp. n. Distribution: Fianarantsoa, Antsiranana Provinces.
9. *robusta* sp. n. Distribution: Fianarantsoa, Toamasina Provinces.
10. *strigosa* sp. n. Distribution: Antsiranana, Fianarantsoa, Mahajanga, Toamasina, Toliara, Diego Suarez Provinces.



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